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JAPAN · ECONOMIC · INSTITUTE

JEI REPORT

A Two-Part Report: A and B

NO. 4A

January 31, 1992

JAPANESE AND U.S. PRODUCTIVITY AND ECONOMIC GROWTH

SUMMARY

Japan has enjoyed high rates of productivity growth by virtually every measure since World War II and especially in the period between the end of the war and the first oil shock in 1973. During this nearly 30-year span, marked by strong productivity performances in many nations, Japan was the outstanding performer. This feat had parallels to the achievements made by America in the 60 years preceding World War II when the United States was a leader in productivity gains.

Economists have found strong evidence for the "catch-up" hypothesis of productivity gains, at least among the group of developed nations. Such a hypothesis appears to have been a factor in prewar U.S. productivity growth as well as postwar Japanese productivity improvements. Strong rates of capital accumulation, too, were evident in America in the prewar era and in Japan in the postwar period. And, since technological change is tied closely to capital growth, technology appears to have been a factor in boosting the American and the Japanese economies in the prewar and postwar periods, respectively.

These arguments suggest that the relatively rapid growth in Japanese productivity in the recent past was partly a historical anomaly. Even though Japan's ongoing high rate of business investment indicates that productivity growth components still are present, capital spending has become less potent yen for yen in generating economic expansion in recent years. As the Japanese population ages — and capital substitutes for labor — capital growth alone may be insufficient by the end of the decade to keep the Japanese economy advancing at recent rates.

Japan's Recent Economic Performance

In the years since at least the Korean War Japan has enjoyed high rates of economic growth relative to other industrialized nations. One way of comparing growth rates among nations is to look

at relative rates of advancement in labor productivity, essentially the rate of increased output per worker.[1] According to Bureau of Labor Statistics data, labor productivity in manufacturing grew an average 7.5 percent per year between 1950 and 1990 in Japan, nearly three times as fast as the 2.7 percent average gain registered for that period in the United States.[2] Even if the extraordinary productivity advances that resulted from reconstruction following World War II are ignored by using 1960-90 figures, annual Japanese productivity growth for the period amounted to 6.9 percent against 2.9 percent for the United States.

Japan's rapid productivity increases have elevated its status to that of an economic superpower second only to the United States. To some Americans this development points to an unpleasant, not-so-distant future in which Japan's economy will be the world's largest — just as earlier American growth enabled this country to surge past other nations economically. In general, public policy discussions of the issue in the United States have two dimensions. First, analysts urge Americans to rediscover the traits that "made this country great" and the most productive nation in the world. Second, many experts urge the United States to look across the Pacific in hopes of discovering the Japanese secret of rapid economic growth. However, economic research suggests that both these approaches, while not without merit, contain numerous blind alleys. To understand why, one has to understand the path each nation took to its current position.

The Long Sweep of History: The United States

Few Americans question that the United States ended World War II as the world's preeminent economic power. But how did that happen? The average American probably has little understanding of how the United States went from an obvious position of economic inferiority as a British colony at the time of the Revolutionary War to its economic superpower status 175 years or so later. If pressed, many Americans probably would attribute a major role to "Yankee ingenuity." Certainly, many famous U.S. inventors, such as Thomas Edison, were active around the turn of the century as America surpassed in economic terms the leading power of the time, Great Britain. But linking the U.S. spurt to inventions seems an inadequate explanation. Inventions easily could be copied in a few short years by other countries, thereby conveying little permanent economic advantage to the United States.

Economists and historians have much more complex explanations. A recent article by Gavin Wright, an economic historian at Stanford University, is particularly eye-opening. He claims that abundant natural resources in the United States played an important role in America's rise to economic preeminence. Especially in the first four decades of this century, Mr. Wright argues, the United States was able to tap oil, iron ore and other natural resources to build a mighty industrial machine. He implies that such natural endowments extended a critical advantage to this country over

[1]Total factor productivity, an alternative gauge, adjusts for the expansion in the amount of capital with which each worker works and may take other factors into account as well; for this reason TFP growth is likely to be far smaller than the gains in labor productivity. For additional details concerning both concepts, see *JEI Report* No. 36A, September 22, 1989.

[2]Department of Labor, Bureau of Labor Statistics, "Output per Hour, Hourly Compensation, and Unit Labor Costs in Manufacturing, Twelve Industrial Countries, 1950-1990," (unpublished data) December, 1991, p. 1.

The JEI REPORT (ISSN 0744-6489) is published weekly except for the New Year, Memorial Day, Labor Day, Thanksgiving and Christmas holiday weeks for $40 per year by the Japan Economic Institute of America, 1000 Connecticut Avenue, N.W., Washington, D.C. 20036. Second class postage paid at Washington, D.C. POSTMASTERS: Send address changes to JEI REPORT, 1000 Connecticut Avenue, N.W., Washington, D.C. 20036.

the nations of Europe, for example.[3] (While other nations and territories in the Middle East and elsewhere were better endowed, their resources either were undiscovered in the early decades of this century or the areas lacked the means to link resources to industrial development.)

In Mr. Wright's view a highly educated labor force, abundant capital stock and a strong infrastructure were more effects than causes of America's relative industrial advantage. However, once the U.S. labor force did become relatively well-educated, for example, the United States could maintain its economic lead for years even after resource abundance ceased to be a major contributor. (America's resources stopped being an important advantage once improved international transportation and other factors enabled nations to exploit worldwide natural resources more easily.)

Certainly the data on this country's rise in productivity and economic status are impressive. From being 9.9 percent poorer on a per-capita basis than Great Britain in 1870, the United States was 5 percent wealthier by 1890 and 46 percent wealthier by 1929. During the 59 years between 1870 and 1929 real gross domestic product per worker increased 3.5 times, or 2.1 percent a year. By 1913, if not earlier, real gross domestic product per person was almost 14 percent higher than in any of five other industrialized nations (France, West Germany, the Netherlands, Great Britain and Japan) included in one well-known study; by 1950 the gap had widened further.[4]

Mr. Wright's view of American economic history has important implications for current economic policy. First, it does not mean that Americans are doomed unless they discover more domestic oil, for example. Natural resources no longer matter as much as they did in the early decades of the 20th century; in hindsight that period appears to have been unique in that respect. What is more important is that the elevation of natural resources as an explanatory factor during this critical period of American economic history implies a lesser role for education, innovation and cleverness, which some Americans probably have assumed were the explanations. In short, if Mr. Wright is correct, Americans got where they did partly by the good fortune of living in a geographically blessed place, not by being smart or particularly industrious. If hard work, education and training are critical to the future, Americans may not have an inherent advantage over other nations in this regard.

Not all scholars put equal emphasis on the explanatory power of natural resources, of course. Edward N. Wolff of New York University gives attention mainly to the growth of the capital stock as well as the interaction between an accumulating stock of plant and equipment and other dimensions of economic growth, such as total factor productivity growth, a measure that normally is assumed to be independent of the size of the capital stock and the labor force. He notes that Great Britain achieved the highest intensity of capital use in 1870 and 1880, years it also held top ranking as an economic power. By 1938 the United States had both the most capital-intensive economy and the wealthiest one, having experienced exceptionally high rates of growth in both capital and per capita income in the half-century since 1880. This relationship between capital stock and economic well-being also held true for nations in intermediate positions of capital growth and economic expansion.[5]

[3]Gavin Wright, "The Origins of American Industrial Success, 1879-1940," *The American Economic Review*, LXXX, September 1990, pp. 651-668.

[4]Angus Maddison, "Growth and Slowdown in Advanced Capitalist Economies: Techniques of Quantitative Assessment," *The Journal of Economic Literature*, XXV, June 1987, pp. 649-698.

[5]Edward N. Wolff, "Capital Formation and Productivity Convergence Over the Long Term," *The American Economic Review*, LXXXI, June 1991, pp. 565 579.

The Long Sweep of History: Japan

Japan's rise to second place among economic powerhouses is no less dramatic than the earlier process in the United States. Using the same benchmarks as above, Japan was only 17.4 percent as productive as Great Britain in 1870 — 17 years after Commodore Matthew Perry was credited with beginning the process of opening Japan to the West and a mere two years after the Meiji Restoration began transforming Japan, a benchmark often considered the beginning of the country's industrialization process. In the last three decades of the 19th century and the first half of this century, however, Japan's economy grew only slightly faster than the economies of leading industrial countries despite the fact that Japan could tap two centuries of Western technological advances for the first time. By 1929 Japanese hourly per-worker productivity still was only 31.4 percent that of British workers. The United States and other industrial countries lost little ground to Japan; Japanese hourly per-worker output improved only from 19.3 percent of the comparable American figure in 1870 to 21.5 percent in 1929.[6]

Japan's rise to the number-two spot really started after reconstruction began to alleviate the massive destruction from World War II. In 1950 U.S. gross domestic product per hour worked was 7.2 times as large as that of Japan's. By 1984 the gap had narrowed to 1.8, and by the end of 1991 it had shrunk to an estimated 1.5, suggesting that American workers are roughly 50 percent more productive than their Japanese counterparts once the differing sizes of the two labor forces and the number of hours worked on the job are taken into consideration. (This measure does not make any adjustment for the size or the quality of the capital stock available to workers.)

A disproportionate amount of the U.S. advantage is a result of low productivity in the Japanese agricultural sector. Several studies, including some that exclude agriculture or adjust for capital stock, conclude that the U.S.-Japan productivity gap is far smaller than 1.5:1, although the authors of these studies all agree that the United States still has an overall advantage, if not in every industrial sector.

Based on a transpacific productivity ratio of 1.5:1 in 1991 and assuming a continuation of the rates of change observed since 1984, Japanese GDP per hour worked will surpass the comparable figure for the United States in the year 2011. However, as will be argued below, extrapolation of past trends probably overstates the speed with which Japan will achieve productive equality with the United States. In addition, with this country's far larger labor force, the absolute size of the American gross domestic product still will be much bigger in 2011 — a conclusion made even more likely because the Japanese labor force is expected to begin to shrink by the end of this decade (see *JEI Report* No. 46A, December 7, 1990).

Explaining Japan's Rise to the Number-Two Position: 1950 to 1973

Although the figures just cited suggest that Japan's rate of economic growth is not likely to prevent the United States from being the most economically productive nation for the entire 20th century, the Asian nation's accomplishments are impressive, particularly since World War II. What changed after World War II? For many economists the answer is a phenomenon sometimes called "trend acceleration."[7]

Briefly, a number of factors came together after World War II to propel Japan to the front ranks. The single most important element was an increased rate of capital accumulation. Domestic

[6]Calculated from data in Maddison, *op. cit.*, p. 683.

[7]A path-breaking analysis of the Japanese case is provided by Kazushi Ohkawa and Henry Rosovsky, *Japanese Economic Growth: Trend Acceleration in the Twentieth Century* (Stanford, California: Stanford University Press, 1973).

firms used the surplus savings of Japanese households, as well as their own earnings, to invest in new plant and equipment at an unprecedented rate. Figures cited by Angus Maddison in an assessment of six industrialized nations show, for example, that Japan's nonresidential gross capital stock adjusted for inflation increased 7.2 times between 1950 and 1973, more than twice as fast as any of the other five nations (France, West Germany, the Netherlands, Great Britain and the United States) that he surveyed. The growth in the quantity and the quality of the nonresidential capital stock, in turn, explained 1.4 percentage points of the 7.1 percentage point **acceleration** in the expansion of Japan's real GDP in the 1950-73 period compared to the 1913-50 time frame. (For details of investment and savings in Japan, see *JEI Report* No. 37A, October 4, 1991.) In addition, the labor force grew more rapidly after the war, adding 0.6 point to the acceleration of GDP growth. Other labor and capital variables added 1.8 points to the acceleration of growth for a total of 3.8 points, or 53.5 percent of the faster pace of economic expansion.[8]

These factors were not the only significant ones. Mr. Maddison identified eight more factors that were important in addition to the six capital and labor variables. The first column of Table 1 indicates the contribution to GDP growth of all 14 factors in the 37 years through 1950, with the second and the third columns of data showing their relative contributions at different stages of Japan's postwar experience.

Table 1: **Sources of GDP Growth in Japan, 1913-84**

(contribution to GDP growth)

	1913-50	1950-73	1973-84
Labor Quantity	0.4%	1.1%	0.4%
Labor Quality	0.6	0.5	0.4
Labor Hoarding	-0.6	0.9	-0.2
Housing Stock	0.0+	0.4	0.5
Plant and Equipment Quantity	0.8	2.1	1.7
Capital Quality	0.5	0.6	0.4
Capacity Use Effect	-0.2	0.4	0.0
Catch-up Effect	0.0	1.0	0.4
Structural Effect	0.6	1.2	0.2
Foreign Trade Effect	0.0+	0.3	0.1
Economies of Scale	0.1	0.3	0.1
Energy Effect	0.0	0.0	-0.1
Natural Resource Effect	0.0	0.0	0.0
Regulation and Crime	0.0	-0.0	-0.1
Total	2.1	8.8	3.7
Gross Domestic Product	2.2	9.4	3.8
Percentage Explained	94.0	93.0	99.0

Note: For descriptions of each category, see source listed below.

Source: Angus Maddison, "Growth and Slowdown in Advanced Capitalist Economies: Techniques of Quantitative Assessment," *Journal of Economic Literature*, XXV, June 1987, p. 679.

[8]Maddison, *op. cit.*, pp. 691, 680.

Two factors stand out in addition to those involving capital and labor. The first is structural change, which refers to the shift in the relative importance of different industries in Japan. As demand grows in productive sectors relative to those with lower productivity, the overall efficiency of an economy increases. This was a particularly important factor for Japan in both the prewar and the postwar period as manufacturing grew relative to agriculture. By contrast, in some other countries, including the United States, the structural effect was a negative factor in the postwar period because arguably unproductive service industries grew vis-a-vis manufacturing.

The second factor that stands out is the catch-up effect. This measure refers to the fact that a country less advanced technologically should be able to grow more rapidly as it copies state-of-the art technologies from the leader (identified throughout Mr. Maddison's sample as the United States). Mr. Maddison's data suggest that this factor was completely absent in Japan's prewar years, a striking result since the Meiji Restoration had occurred 45 years prior to the beginning of the examined period. Some experts have explained this apparent result as a consequence of Japan's backward movement relative to other industrial countries during the militarization of the Japanese economy in the 1930s plus the intensified war effort and the country's isolation from 1941 to 1945. In the early postwar period, however, the catch-up effect accounted for 1 point or 10.6 percent of overall growth, according to Mr. Maddison's analysis.

The Slowdown: 1973 to 1984

Many of the elements contributing to Japan's economic growth reversed themselves in the most recent period surveyed by Mr. Maddison. The slower pace of Japan's economic expansion since 1973, a subject of intense interest to economists, raises the question as to whether the early postwar period was a sort of "Golden Age" for economic growth that is not likely to be repeated soon. If so, the data suggest that the period was particularly gilded in Japan since growth accelerated the most from the prewar period and then decelerated the most after 1973.

The choice of 1973 as the dividing line is not arbitrary. That year marked the beginning of what now is known as the first oil shock. Oil prices rose rapidly in 1973 and 1974 and again in 1979 and 1980, the time of the second oil shock. (For a discussion of this period and an analysis of the macroeconomic effects of oil imports on the Japanese economy, see *JEI Report* No. 33A, August 24, 1990.) Although some economists contend that the shocks hit Japan particularly hard because of its dependence on imported oil, thereby creating an adverse terms of trade effect, Dale Jorgenson of Harvard University suggests that another effect also was important. He argues that during the postwar period until 1973 Japan experienced what he calls "energy-using technical change." By this he means that, absent changes in the prices of inputs, over time technological change will lead to greater use of energy and less consumption of other inputs for a given level of production. He finds, therefore, that the rate of technological change declined after 1973 because the price of energy rose, and Japan (like the United States) was forced to use less energy-intensive (more energy-efficient) forms of production that were less advanced technologically.[9] Even though the production methods used after 1973 may well have incorporated different or even new technology, they were not as productive as those used previously, according to Mr. Jorgenson.

Mr. Jorgenson's results, shown in Table 2, like those of Mr. Maddison reported in Table 1, suggest that the rate at which Japan was able to grow as a result of improving technology slowed markedly after 1973, although the two authors have differing explanations. Mr. Jorgenson attributes the slowdown to higher energy prices, while Mr. Maddison implies that Japan largely had caught up with technology elsewhere.

[9]Dale W. Jorgenson, "Technological Innovation and Productivity Change in Japan and the United States," *The American Economic Review: Papers and Proceedings*, LXXVIII, May 1988, pp. 217-222, especially p. 220.

Table 2: **Alternative Measure of Sources of Economic Growth in Japan**

(contribution to growth of output)

	1960-79	1973-79
Labor Quantity	0.5%	0.4%
Labor Quality	1.0	0.5
Capital Quantity	3.2	2.4
Capital Quality	1.8	0.5
Weighted Average Technical Change	0.7	-1.2
Structural Effect	1.4	1.4
Net Output	8.3	3.8
Percentage Explained	103.6	105.3

Calculated from data in Dale W. Jorgenson, "Technological Innovation and Productivity Change in Japan and the United States," *The American Economic Review: Papers and Proceedings*, LXXVIII, May 1988, p. 218.

Japan's Productivity Growth in Historical Perspective: A Summation

While Messrs. Jorgenson and Maddison measure technology or productivity as a separate factor from capital accumulation, other experts are not so sure. Edward N. Wolff, who studied the period from 1870 to 1979, found that nations with higher rates of capital accumulation also have higher rates of total factor productivity growth.[10] Hence, technology and capital growth are not really independent; new technology tends to get incorporated most easily in new plant and equipment. This finding meshes with Mr. Wolff's result (cited earlier) that fast-expanding nations, such as the United States in the prewar period or Japan in the postwar era, simultaneously have had high rates of total factor productivity growth and capital accumulation; together, these two factors practically guarantee rapid real growth per capita.

Some of Mr. Wolff's other findings have special relevance for Japan. That country's high rate of total factor productivity growth, which Mr. Maddison and others have suggested picked up speed in the three decades after World War II, was part of a pattern, according to Mr. Wolff; on average he found that TFP grew more rapidly worldwide between 1950 and 1979 than from 1870 to 1938 (see Table 3). In addition, he found that total factor productivity tends to grow fastest the further behind a nation is vis-a-vis the technological leader. This result, which confirms earlier findings derived from various methodologies by a number of researchers, is an alternative to Mr. Jorgenson's explanation for the low rates of technological change in Japan after the first oil shock. Most intriguing of all Mr. Wolff's findings concerning Japan is that, once he controls for all other factors, the "country effect" (the fact that Japan is Japan and not some other country) is negative. In other words, Japan enjoyed rapid economic growth during the 109-year period that Mr. Wolff studies, but the unquantifiable conditions unique to Japan ***retarded*** that process. He does not speculate what those factors might have been.[11]

[10]Wolff, *op. cit.*, pp. 572-574.

[11]Wolff, *op. cit.*, p. 574.

Table 3: **Various Measures of Total Factor Productivity Growth in Five Industrialized Countries, 1870-1990**

(average annual rate of change)

	Wolff		Maddison			OECD		
	1870-1938	1950-79	1913-50	1950-73	1973-84	1960-73	1973-79	1979-90
United States	0.77%	1.36%	1.99%	1.85%	0.52%	1.6%	-0.4%	0.3%
Japan	1.32	4.17	1.10	5.79	1.21	5.9	1.4	2.0
West Germany	1.20	3.33	0.86	4.32	1.55	2.7	1.8	0.8
United Kingdom	0.75	1.48	1.15	2.14	1.22	2.3	0.6	1.6
France	n.a.	3.04	1.42	4.02	1.84	4.0	1.7	1.7

Sources: Edward N. Wolff, "Capital Formation and Productivity Convergence Over the Long Term," *The American Economic Review*, LXXXI, June 1991, p. 568.

Angus Maddison, "Growth and Slowdown in Advanced Capitalist Economies: Techniques of Quantitative Assessment," *The Journal of Economic Literature*, XXV, June 1987, p. 665.

Organization for Economic Cooperation and Development, *OECD Economic Outlook*, No. 50, December 1991, p. 136. (Figures refer to total factor productivity growth in the business sector calculated by taking a weighted average of growth in labor and capital productivity.)

Productivity Growth Since 1984

The academic research summarized above, while beginning with the process of modern Japanese economic growth in the 19th century, seldom brings the story beyond the mid-1980s. What has happened since? Net nominal business investment as a share of nominal gross national product rose from 15.3 percent to 19.6 percent between 1984 and 1990, the latest year for which data are available. Similarly, real business investment increased over the same period from 15.1 percent to 21.5 percent of inflation-adjusted GNP. As a result, the growth of the stock of real business capital — which grew as fast as 16 percent in 1970 and then declined annually before bottoming out at around 6 percent in 1983 — rebounded to an approximate 8 percent rate in 1990. Real GNP growth similarly sprang back; after averaging 3.8 percent annually between 1980 and 1985, it increased 4.7 percent a year between 1985 and 1990.

As a result of the increase in plant and equipment, each unit of labor had more capital to work with in the second half of the 1980s than previously, leading to a rise in labor productivity; that implies that the growth of labor productivity remained positive in the 1985-90 period. The Organization for Economic Cooperation and Development estimates that the rise in labor productivity in the business sector increased from 2.9 percent average annual growth between 1973 and 1979 to 3 percent a year between 1979 and 1990. Total factor productivity expanded by a larger margin, going from a 1.4 percent rate of yearly growth in the 1973-79 period to a 2 percent annual pace in the 1979-90 time span (Table 3). Among most European member nations of OECD total factor productivity grew more slowly in the 1979-90 period than in the years between 1973 and 1979, although still at a faster pace than in the United States. Here, total factor productivity turned in a positive performance from 1979 to 1990 after declining in the 1973-79 time span.

However, labor productivity in the critical manufacturing sector alone has exhibited somewhat different trends, particularly in recent years. According to the Bureau of Labor Statistics, average annual manufacturing labor productivity between 1979 and 1990 rose 4.1 percent in Japan and 3.1 percent in the United States but 4.4 percent in the United Kingdom. Of the 12 nations (the United States, Canada, Japan, Belgium, Denmark, France, West Germany, Italy, the Netherlands, Norway, Sweden and the United Kingdom) in the BLS survey, Japan could manage only third place in labor productivity in manufacturing over the period 1979-90; the United States ranked sixth.[12]

Another way of approaching the question of productivity is to look at the trend in a country's capital-to-output ratio. As the Japanese economy grew, the amount of plant and equipment needed to produce a given unit of output increased from less than 0.8 unit of capital per unit of GNP in 1966 to 1.4 units in 1984 and nearly 1.6 units in 1990.[13] Another way of making the same point is to say that each additional unit of capital added less to output than the one before. (In economists' jargon this statement implies that both the marginal physical product and the average physical product of capital declined from previous levels but still were positive.) This argument suggests that larger and larger increments of capital will be necessary to maintain a given rate of economic growth.

Implications for Japan and the United States

Virtually all the factors considered above suggest that Japan will find it next to impossible to regain the economic growth rates that it enjoyed from the 1950s until the time of the first oil shock. Energy prices, which have fallen in real terms in recent years, have less of an effect than the maturation of the Japanese economy. Catch-up by means of borrowing technology from abroad is

[12]Department of Labor, Bureau of Labor Statistics, *op. cit.*

[13]Robert Alan Feldman, "Japanese Business Investment: Too High, Too Low, or Just Right?" *Japanese Economic Research* (Salomon Brothers), August 5, 1991, p. 6.

mostly complete. Similarly, most of Japan's structural shift out of agriculture into manufacturing has been accomplished. Investment will have to grow even beyond its existing high level just to maintain current growth rates over the longer term. In fact, as Japan's labor force ages and begins shrinking toward the end of this decade, the substitution of capital for labor could accelerate, pushing the country's capital-output ratio down further.[14]

On balance, most of the studies summarized above imply a relatively favorable outlook for future economic growth in the United States vis-a-vis that in Japan. Japan has tended to look good relative to the United States, especially in the postwar period, because the two countries for nearly 100 years were at opposite ends of the economic development continuum among industrial or industrializing nations. That period is ending, however.

Contrary to widespread popular belief in both countries, Japan has not achieved productive parity with the United States. As noted earlier in discussing the Maddison study, the gap had narrowed significantly but not disappeared by 1984; estimates for 1990 based on his techniques show that a large gap remains. Mr. Jorgenson and coauthor Masahiro Kuroda of Keio University demonstrate in a recent study that, although several Japanese industries are more productive than their American counterparts, on balance the reverse is true; overall Japanese productivity in 1985 was equal to 87.1 percent of American productivity in the industries studied after adjusting for differences in the amount of capital used. In 13 of 28 industries, the authors observe, the United States enjoyed growing productivity advantages or shrinking productivity disadvantages between 1980 and 1985; on balance relative productivity changed little between these years.[15] (Their analysis requires the use of data that is available only after a considerable lag.)

Messrs. Jorgenson and Kuroda also conclude that the industry-by-industry variance in productivity differences between the United States and Japan is widening. Comparative advantage, considered by economists to be the reason nations trade with each other, is based on differences in relative productivity among countries. As a result, increasing variation across industries creates new opportunities for trade; even if one nation has some advantages in supplying its own market, firms from the other nation are likely to be successful in overcoming those strengths as a result of superior productivity. Trade friction can be expected to rise in conjunction with the number of industries perceiving themselves as under foreign siege.[16]

Messrs. Jorgenson and Kuroda argue, however, that the roots of the trade imbalance between the United States and Japan do not lie with productivity differences. Their argument is consistent with economic theory, which suggests that even if the United States had an absolute productivity

[14]However, between 1992 and 1995 Japan will be able to maintain high rates of growth without significant increases in capital spending because relatively large increases in the capital stock already are in the pipeline. For details, see *Ibid.*, p. 10.

[15]Dale W. Jorgenson and Masahiro Kuroda, "Productivity and International Competitiveness in Japan and the United States, 1960-1985" in C.R. Hulten (ed.), *Productivity in the U.S. and Japan* (Chicago, Illinois: University of Chicago Press, 1990); reprinted with revisions in B. Hickman (ed.), *Productivity and International Competitiveness* (Oxford, England: Oxford University Press, forthcoming).

[16]Rising trade friction often is reflected in an increasing number of complaints concerning "fairness" in international trade. For an econometric effort to find evidence for a relationship between the number of fairness complaints in the media and sectoral trade imbalances, see Roger Benjamin, Loren Yager, Michael Shires and Mark Peterson, *The Fairness Debate in U.S.-Japan Economic Relations* (Santa Monica, California: Rand Center for U.S.-Japan Relations, 1991), pp. 18-24. They find weak evidence of a relationship in manufacturing as a whole but not in the areas of high technology manufacturing or agriculture.

disadvantage in every industry trade still would be worthwhile; the United States simply would export those goods in which its productivity disadvantage was the smallest. Whether exports would exceed imports or vice versa is linked not to this country's absolute or relative productivity vis-a-vis its trading partners but rather to macroeconomic factors.

In any case, as noted above, the United States still has a productivity edge on Japan; in some industries this edge has grown even as the bilateral trade picture with Japan deteriorated from the U.S. perspective. Messrs. Jorgenson and Kuroda suggest that the real causes of the U.S.-Japan trade imbalance lie in currency movements, especially the strong dollar of the early 1980s, and in relative rates of wage and price increases, which were greater in the United States than Japan at that time. As a result, the authors imply that extraordinary efforts — such as industrial policy to boost U.S. competitiveness -- are misguided. (For a description of Japanese industrial policy and comparisons with proposed U.S. policies, see *JEI Report* No. 29A, August 2, 1991.)

Conclusion

Japan has had an impressive record of economic growth over the past century, but for the first half of that period the United States had an equally impressive performance. Similarly, Japan's days in the spotlight as the country with the fastest-growing economy among mature industrial nations appear to be numbered.

To whatever degree some American policymakers may wish otherwise, Japan's achievements will not go away. On the contrary, the ways in which Japan and the United States interact economically are likely to increase unless trade restrictions rise significantly. Should tensions lead to such a change in the relationship, both countries, which have benefited until now from relatively open trading systems, would be the losers.

For further information, contact **Douglas Ostrom**.

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The views expressed in this report are those of the author and do not necessarily represent those of the Japan Economic Institute.